

ABSTRACT

The field-effect transistor includes: a ferromagnetic layer, having a film thickness of 50 nm or less, which is made of a Ba-Mn oxide showing ferromagnetism at 0°C or higher; a dielectric layer made of a dielectric material or a ferroelectric material, and the ferromagnetic layer and the dielectric layer are bonded to each other. Thus, it is possible to control the magnetism, the electricity transport property, and/or the magnetic resistivity effect at 0°C or higher.